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English Translation
of
International Preliminary Examination Report

**PRELIMINARY
INTERNATIONAL TEST REPORT**

International file number PCT/CH 03/00624

On Point V

Substantiated assessment according to Rule 66.2(a)(ii) regarding discovery, invention activity and commercial applicability; Documentation and comments in support of this assessment

1) The following documents are referred to:

- D1: US-A-5 912 767 (LEE ROBERT ARTHUR) June 15th, 1999 (1999-06-15)
- D2: US-B1-6168100 (KATSUMATATAKATOSHI ET AL) January 2nd, 2001 (2001-01-02)
- D3: US-A-6 068 691 (BENOIT DENNIS R ET AL) May 30th, 2000 (2000-05-30)
- D4: EP-A-O 952 009 (TOYOTA MOTOR CO LTD) October 27th, 1999 (1999-10-27)
- D5: US-B1-6 242 510 (KILLEY EDWARD J) June 5th, 2001 (2001-06-05)
- D6: US-B1 -6 344 245 (KAY RALPH) February 5th, 2002 (2002-02-05)
- D7: U.S. 2003/129404 A1 (BRADLEY RICHARD A ET AL) July 10th, 2003 (2003-07-10)
- D8: US-A-3 957 354 (KNOP KARL) May 18th, 1976 (1976-05-18) mentioned in the application
- D9: US-A-4 434 010 (ASH GARY S) February 28th, 1984 (1984-02-28) mentioned in the application

D1=US5912767 reveals diffractive elements that can, for example, be used in optically variable inks (optisch variable Tinten) for holographic copies or in adhesives (Klebemittel). Each element consists of a thin metal foil and is stamped on one or both sides with a diffractive pattern. The size of the elements amounts to 30 µm or less, and they therefore have the typical dimensions of pigment platelets. This diffractive patterns consist of grooves (Rillen) or geometrically shaped indentations (Vertiefungen). The diffractive structures can be introduced in the form of concentric circular patterns or concentric polygonal grooves. Figs. 1 and 2 reveal different diffractive elements. Fig. 1 displays a diffractive element that shows dissimilar areas which in each case contain different diffractive patterns that, depending on the viewing angle, generate different diffractive effects. In Fig. 2, a thin foil is stamped with concentric circular grooves that show a displacement between 0.4 and 0.6 µm.

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D2=US6168100 reveals imprinted metallic pigment platelets which are used as holographic pigments. Their average size lies in the range of 25 to 50 μm , their thickness in the range of 0.4 to 1 μm . Fig. 9 shows a metal foil imprinted on both sides that is subsequently reduced to platelets. The metal foil can, for example, be aluminum foil. The metallic platelets can optionally be coated with an acryl-melamine resin.

D3=US6068691 reveals imprinted platelet-shaped metal pigments, which, in printing inks and coatings in, for example, the form of holograms, can be used for security documents. The production procedure includes stamping at least one face of a support layer that is subsequently metallized in order to form a stamped metallic film (thickness: 100-500 Ångström = 0.01-0.05 μm), which is subsequently pulverized into pigment platelets (size 25-50 μm). The diffraction patterns can be diffractive or holographic patterns. Example 1 describes an analogous aluminum pigment.

D4=EP0952009 reveals holographic pigments (particle size 5-50 μm , thickness 0.3-5 μm) with an imprinted pattern. The production procedure entails applying a resin layer on a stamped support layer, removing the film resin and applying a thin metallic film on the resin impregnated surface plus subsequent pulverization.

D5=US6242510 reveals adhesive labels that consist of a polymeric medium and stamped diffractive platelets. The platelets may be made of aluminum and have a length of 50-100 μm and a thickness of 9-12 μm .

D6=US6344245 reveals security documents whose production process is merely distinguished from that in the patent application in that the metal film is not pulverized in the final step. The metal film can contain holograms or diffraction patterns in the UV wavelength range.

2) Novelty – Article 33 (1) and (2) PCT

Novelty is recognized for the independent claims 1 and 23, since none of the D1-D9 documents reveals the feature of epitaxial application of the sealant.

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Notwithstanding, novelty is also acknowledged for Claims 2-22 and 24-40, which either depend on Claim 1 or 23 or co-reference them.

3) Inventive activity – Articles 33 (1) and (3) PCT

The problem underlying the present application can be seen as provision of a pigment that affords diffraction color effects. The solution found for this consists in providing a pigment that exhibits a defined diffractive structure in the surface area that generates diffractive effects, e.g. holograms, in the UV and/or visible wavelength range. Furthermore, the pigment exhibits an internal diffractive structure that is surrounded by an epitaxially applied sealant material.

The nature of the epitaxial application of the sealant material is not revealed in any of the documents cited, just as there is no reference in the technology status report as to the possible advantages of this method. The view is therefore presented that epitaxy does not represent an ordinary application procedure that an expert would select without recourse to invention. Inventive activity is therefore acknowledged for the subject matter of Claims 1-40.